

Notice of Allowability	Application No.	Applicant(s)	
	10/808,654	SANDWITH, REX	
	Examiner	Art Unit	
	Gautam Sain	2176	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendments/remarks filed on 4/29/2006.
2. ☒ The allowed claim(s) is/are Original 1, 3-5, 7-19 (renumbered 1-17).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>6/29/06</u> 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____ |
|---|---|

DETAILED ACTION

EXAMINER'S AMENDMENT

A) An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. R. Alan Burnett, PS on 9/8/2006.

The application has been amended as follows:

1. (Currently Amended) A method to express a topological structure of an object in an image including a plurality of binary branches, comprising:

~~tracing the plurality of binary branches; and~~

generating a bitmap skeleton of the object;

tracing the bitmap skeleton from a suitable end point on the skeleton and

recursively selecting adjacent pixels of the bitmap skeleton to identify lines, nodes and endpoints; and

adding line and grouping elements to an extended markup language (XML) file based on the lines, nodes and endpoints that are identified to generate an XML

~~as the plurality of binary branches are traced, generating an extended markup language (XML) file including elements and having a nesting structure describing the topology structure of the object.~~

2. (Canceled).

3. (Currently Amended) The method of claim [[2]] 1 where the adding of line and grouping elements to the XML file further comprises:

adding a line element as a child of a grouping element;

adding a transform attribute to the grouping element with rotation and translation properties, wherein the translation value is indicative of the length of the parent line and the rotation values is indicative of an [[the]] angle the parent line would be rotated to align with the child line; and

adding an attribute to the line element with a value equal to the length of the child line.

4. (Original) The method of claim 1, wherein the XML file that is generated is used to store attributes representing physical properties of the topology structure without requiring a location referencing system.

5. (Currently Amended) A computer-readable medium having instructions stored thereon, which when executed express a topological structure of an object in an image including a plurality of binary branches by performing operations, including:

~~tracing the plurality of binary branches; and~~

generating a bitmap skeleton of the object;

tracing the bitmap skeleton from a suitable end point on the skeleton and recursively selecting adjacent pixels of the bitmap skeleton to identify lines, nodes and endpoints; and

adding line and grouping elements to an extended markup language (XML) file
based on the lines, nodes and endpoints that are identified to generate an XML

~~as the plurality of binary branches are traced, generating an extended markup~~
~~language (XML) file including elements and having a nesting structure describing the~~
topology structure of the object.

6. (Canceled)

7. (Previously Presented) The computer-readable medium of claim 5, wherein
execution of the instructions performs the adding of line and grouping elements to the
XML file by performing the further operations of:

adding a line element as a child of a grouping element;

adding a transform attribute to the grouping element with rotation and translation
properties, wherein the translation value is indicative of the length of the parent line and
the rotation values is indicative of the angle the parent line would be rotated to align with
the child line;

adding an attribute to the line element with a value equal to the length of the child
line.

8. (Original) The computer-readable medium of claim 5, wherein the XML file that
is generated is used to store attributes representing physical properties of the topology
structure without requiring a location referencing system.

9. (Currently Amended) The method of claim [[2]] 1, wherein the bitmap skeleton comprises a bitmap having a foreground color defining skeleton pixels and a background color, and wherein lines, nodes, and endpoints are identified by performing operations comprising:

determining, for a current pixel, a number of neighbor pixels having a foreground color; and

if the number of neighbor pixels having a foreground color is one, setting the current pixel to a background color and selecting the neighbor pixel with the foreground color as a new current pixel.

10. (Previously Presented) The method of claim 9, further comprising:

if the number of neighbor pixels having a foreground color is two,

identifying the current pixel is a node;

setting the current pixel and each of the two neighbor pixels with the foreground color to the background color;

starting at a first of the two neighbor pixels, recursively selecting adjacent pixels to trace a path of a first branch connected to the node; and

starting at a second of the two neighbor pixels, recursively selecting adjacent pixels to trace a path of a second branch connected to the node.

11. (Previously Presented) The method of claim 9, further comprising:

if the number of neighbor pixels having a foreground color is zero,
identifying the current pixel as an endpoint of a line; and
adding an attribute in a corresponding element in the XML file indicative of a
length of the line.

12. (Currently Amended) The computer-readable medium of claim [[6]] 5, wherein the bitmap skeleton comprises a bitmap having a foreground color defining skeleton pixels and a background color, and wherein execution of the instructions identifies lines, nodes, and endpoints by performing operations including:

determining, for a current pixel, a number of neighbor pixels having a foreground color; and

if the number of neighbor pixels having a foreground color is one, setting the current pixel to a background color and selecting the neighbor pixel with the foreground color as a new current pixel.

13. (Previously Presented) The computer-readable medium of claim 12, wherein execution of the instructions further performs operations including:

if the number of neighbor pixels having a foreground color is two,
identifying the current pixel is a node;
setting the current pixel and each of the two neighbor pixels with the foreground color to the background color;

starting at a first of the two neighbor pixels, recursively selecting adjacent pixels to trace a path of a first branch connected to the node; and

starting at a second of the two neighbor pixels, recursively selecting adjacent pixels to trace a path of a second branch connected to the node.

14. (Previously Presented) The computer-readable medium of claim 12, wherein execution of the instructions further performs operations including:

if the number of neighbor pixels having a foreground color is zero,
identifying the current pixel as an endpoint of a line; and
adding an attribute in a corresponding element in the XML file indicative of a length of the line.

15. (Previously Presented) The computer-readable medium of claim 5, wherein execution of the instructions further performs the operation of enabling attributes indicative of physical characteristics of the object to be added to the XML file.

16. (Previously Presented) A method to express a topological structure of an object in an image, comprising:

generating a bitmap corresponding to the image including a bitmap skeleton of the object;

tracing the bitmap skeleton from a suitable end point on the skeleton to identify lines, nodes and end points of the bitmap skeleton; and

adding line and grouping elements to an XML file in consideration of the lines, nodes and endpoints that are identified, where the adding of line and grouping elements to the XML file includes,

adding a line element as a child of a grouping element;

adding a transform attribute to the grouping element with rotation and translation properties, wherein the translation value is indicative of the length of a parent line and the rotation value is indicative of an angle between the parent line and the child line; and

adding an attribute to the line element with a value indicative of a length of the child line.

17. (Previously Presented) The method of claim 16, wherein the bitmap skeleton comprises a bitmap having a foreground color defining skeleton pixels and a background color, and wherein lines, nodes, and endpoints are identified by performing operations comprising:

determining, for a current pixel, a number of neighbor pixels having a foreground color; and

identifying whether the current pixel corresponds to a line, a node, or an endpoint depending on the number of neighbor pixels having the foreground color.

18. (Previously Presented) The method of claim 16, wherein selective branches of the bitmap skeleton may have a different width than branches of the bitmap skeleton, the method further comprising:

adding attributes to line elements of the XML file corresponding the selective branches indicative of a width of the selective branches.

19. (Previously Presented) The method of claim 16, wherein the XML file may be rendered by an Scalar Vector Graphics (SVG) viewer to reproduce the object. --

B) Original claims 1, 3-5 and 7-19 are renumbered to Final Claims 1-17, respectively.

Reasons for Allowance

C) The following is an examiner's statement of reasons for allowance:

The prior art of record teaches XML and a topological structure of an object in an image.

The prior art fails to expressly teach, as a combination with the limitations cited in the claims, tracing the bitmap skeleton from a suitable end point on the skeleton and recursively selecting adjacent pixels of the bitmap skeleton to identify lines, nodes and endpoints.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gautam Sain whose telephone number is 571-272-4096. The examiner can normally be reached on M-F 9-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather Herndon can be reached on 571-272-4136. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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